



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/719,135	11/21/2003	Jae Hong Kim	30205/38081 A	2226
4743	7590	10/27/2005	EXAMINER	
MARSHALL, GERSTEIN & BORUN LLP 233 S. WACKER DRIVE, SUITE 6300 SEARS TOWER CHICAGO, IL 60606			MARCHESCHI, MICHAEL A	
			ART UNIT	PAPER NUMBER
			1755	

DATE MAILED: 10/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/719,135

Applicant(s)

KIM ET AL.

Examiner

Michael A. Marcheschi

Art Unit

1755

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 31-40, 44, 45, 50 and 51 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 31-40, 44, 45, 50 and 51 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. 10/096,266.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/8/05 has been entered.

Claims 31-40, 44, 45 and 50-51 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The new matter added to the independent claims is the limitation “less than 3” to define the pH because the specification never literally defines this value of less than 3.

Claims 31-40, 44, 45 and 50-51 rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a buffer solution of an organic acid/organic acid salt mixture at a specific ratio (1:1 ratio), does not reasonably provide enablement for a buffer solution of an organic acid/organic acid salt mixture when no ratio is defined. The specification

Art Unit: 1755

does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims. The only use of a buffer solution in the specification is defined as one having a specific ratio. Absent this ratio (and specific buffer used) in claims 44, 45, and 50-51, the scope of the above claims is not enabled by the specification.

Claims 31-40, 44, 45 and 50-51 are rejected under 35 U.S.C. 103(a) as obvious over Yano et al. (590) in view of Carpio et al. and further in view of either (1) applicants own admission on page 4, lines 10-14 and (2) Mueller et al. (935).

Yano et al. (590) teach in column 8, line 11-column 9, line 55, column 11, line 30-column 12, line 55, column 13, lines 35+ and column 16, lines 32-35, a method of polishing metal composite layers (claimed material obvious see below) which comprising polishing said layer with a polishing composition (having the claimed pH) which comprises water, an abrasive (claimed size and amount, cerium ammonium nitrate oxidizing agent (used in the claimed amounts), an inorganic acid (nitric acid, etc. used in the claimed amounts) and a pH control agent.

Carpio et al. teach in column 5, lines 25-30 and line 41 (buffer solution) that the claimed mixture (organic acid/salt) is a known buffering solution (pH adjustor).

Mueller et al. (935) teach in section [0035], conventional polishing parameters.

Applicants admit on page 4, lines 10-14, conventional polishing parameters.

Art Unit: 1755

Although the primary reference does not literally define polishing a RTN pattern, the broad disclosure on page 16, lines 32-35 makes this obvious because metal composites include nitrides of the defined metals (combination or alloy of the defined materials).

With respect to the amount of nitrate, abrasive size, abrasive amount, inorganic acid and amount thereof and pH, the reference clearly defined these.

With respect to the buffer solution, it is the examiners position that one skilled in the art would have found the use of any conventional buffer solution, as shown by Carpio et al., obvious as the pH adjustor according to the primary reference because the substitution of one known pH adjustor for another that is used for the same purpose is well within the level of ordinary skill in the art. It is the examiners position that the pH adjustor will also function as a Ph buffer in that it will control the pH. Assuming arguendo about the "buffer" limitation, no distinction is seen to exist because the composition, as defined by the combined references, is the same, irrespective of what the components are called.

Finally, with respect to the polishing method limitations of claims 32-34, these limitations would have been obvious because (1) applicants admit that polishing parameters within the claimed ranges are known to be used in polishing methods and (2) Mueller et al. teach that the polishing parameters within the claimed ranges are known to be used in polishing methods.

Claims 31-40, 44, 45 and 50-51 are rejected under 35 U.S.C. 103(a) as obvious over Yano et al. (590) in view of Carpio et al. and further in view of either (1) applicants own

Art Unit: 1755

admission on page 4, lines 10-14 and (2) Mueller et al. (935), as applied above, and further in view of Hattori et al. (818).

This rejection is an alternative rejection to the one defined above.

This rejection relies on the combination of Yano et al. (590) in view of Carpio et al. and further in view of either (1) applicants own admission on page 4, lines 10-14 and (2) Mueller et al. (935), as applied above, the examiners reasoning being incorporated by reference.

Hattori et al. teach in column 3, lines 45-58 and column 4, lines 47-51 that abrasive for polishing compositions can be inorganic or organic/inorganic composite particles (composite particles being of the structure according to Yano et al.).

Although Yano et al. teaches that organic/inorganic particles are used (as the abrasive), it is the examiners position that one skilled in the art would have found the use of inorganic particles, alone, obvious in place of the composite particles according to Yano et al. because Hattori et al. teaches that both inorganic and organic/inorganic particles are functionally equivalent particles for use in polishing compositions and the substitution of one functionally equivalent material for another that is used for the same purpose is clearly within the scope of the skilled artisan.

Claims 31-40, 44, 45 and 50-51 are rejected under 35 U.S.C. 103(a) as obvious over Dirksen et al. in view of Yano et al. (590) and Carpio et al. and further in view of (1) applicants own admission on page 4, lines 10-14 and (2) Mueller et al. (935).

Dirksen et al. teach in sections [0008]-[0009] and [0017]-[0020], a method of polishing metal composite layers (claimed material obvious see below) which comprising polishing said

Art Unit: 1755

layer with a polishing composition (having the claimed pH) which comprises water, an abrasive, a cerium compound oxidizing agent, a pH control agent (nitric acid, etc.) and a pH buffer (section [0020] states that at least one additive can be used and the defined additives include cerium containing oxidizers and pH buffers, thus establishing that both these components can be present).

Although the primary reference does not literally define polishing a RTN pattern, the broad disclosure in section [0008] makes this obvious because metal composites include nitrides of the defined metals (combination (alloys of the above metals)). With respect to the oxidizer, the reference teaches that cerium compounds can be used and this broadly makes obvious the claimed material because cerium ammonium nitrate is a known cerium compound oxidizing agent as shown by Yano et al. With respect to the amount, one skilled in the art would have known by routine experimentation and optimization the desired oxidizer concentration needed to produce the desired polishing performance of the composition. In addition, although the primary reference does not literally define an amount for this component, it is the examiners position that since the reference fails to mention any specific concentration (criticality), this makes the use of any conventional amount for the oxidizer obvious. Since Yano et al. teach conventional amounts for oxidizers in polishing compositions, one skilled in the art would have found this amount to be obvious in the teaching according to the primary reference because it is the examiners position that the primary reference implies that conventional additives are used in conventional amounts.

The primary reference clearly teaches that the claimed acid can be used. With respect to the amount of acid, one skilled in the art would have known by routine experimentation and optimization the desired acid concentration needed to adjust the pH to be within the range of the

Art Unit: 1755

primary reference, said amount proving to be optimal within the claimed range absent evidence to the contrary.

With respect to the amount of abrasive, one skilled in the art would have known by routine experimentation and optimization the desired abrasive concentration needed to produce the desired abrasive character of the polishing composition. In addition, although the primary reference does not literally define an amount for this component, it is the examiners position that since the reference fails to mention any specific concentration (criticality), this makes the use of any conventional amount for the abrasive obvious. Since Yano et al. teach conventional amounts for abrasives in polishing compositions, one skilled in the art would have found this amount to be obvious in the teaching according to the primary reference because it is the examiners position that the primary reference implies that the abrasive is used in conventional amounts.

With respect to the buffer solution, it is the examiners position that one skilled in the art would have found the use of any conventional buffer solution, as shown by Carpio et al., obvious as the pH buffer according to the primary reference because the primary reference states “pH buffers” in general and this encompasses and makes the use of any known pH buffer for polishing compositions obvious in view of the generic description.

Finally with respect to the polishing method limitations of claims 32-34, these limitations would have been obvious because (1) applicants admit that polishing parameters within the claimed ranges are known to be used in polishing methods and (2) Mueller et al. teach that the polishing parameters within the claimed ranges are known to be used in polishing methods.

Art Unit: 1755

Claims 31-40, 44, 45 and 50-51 are rejected under 35 U.S.C. 103(a) as obvious over Wang et al. (365) in view of Yano et al. (590) and Carpio et al. and further in view of (1) applicants own admission on page 4, lines 10-14 and (2) Mueller et al. (935).

Wang et al. teach in column 4, lines 32-38 and column 5, line 50-column 6, line 39, a method of polishing metal composite layers (claimed material obvious see below) which comprising polishing said layer with a polishing composition (having the claimed pH because “about” permits some tolerance) which comprises water, an abrasive, a cerium compound oxidizing agent, a pH control agent (nitric acid, etc.) and a pH buffer (column 6, lines 15-39 states that at least one additive can be used and the defined additives include cerium containing oxidizers and pH buffers, thus establishing that both these components can be present).

Although the primary reference does not literally define polishing a RTN pattern, the broad disclosure in column 4, lines 32-38 makes this obvious because metal composites include nitrides of the defined metals (combination (alloys of the above materials)). With respect to the oxidizer, the reference teaches that cerium compounds can be used and this broadly makes obvious the claimed material because cerium ammonium nitrate is a known cerium compound oxidizing agent as shown by Yano et al. With respect to the amount, one skilled in the art would have known by routine experimentation and optimization the desired oxidizer concentration needed to produce the desired polishing performance of the composition. In addition, although the primary reference does not literally define an amount for this component, it is the examiners position that since the reference fails to mention any specific concentration (criticality), this makes the use of any conventional amount for the oxidizer obvious. Since Yano et al. teach conventional amounts for oxidizers in polishing compositions, one skilled in the art would have

Art Unit: 1755

found this amount to be obvious in the teaching according to the primary reference because it is the examiners position that the primary reference implies that conventional additives are used in conventional amounts.

The primary reference clearly teaches that the claimed acid can be used. With respect to the amount of acid, one skilled in the art would have known by routine experimentation and optimization the desired acid concentration needed to adjust the pH to be within the range of the primary reference, said amount proving to be optimal within the claimed range absent evidence to the contrary.

With respect to the amount of abrasive, the primary reference clearly defined this.

With respect to the buffer solution, it is the examiners position that one skilled in the art would have found the use of any conventional buffer solution, as shown by Carpio et al., obvious as the pH buffer according to the primary reference because the primary reference states "pH buffers" in general and this encompasses and makes the use of any known pH buffer for polishing compositions obvious in view of the generic description.

The examiner acknowledges that Wang et al. teaches a persulfate compound but it is the examiners position that this component will not materially affect the basic and novel characteristics of the invention, thus the reference composition is still within the scope of claimed "consisting essentially of" language. The transitional phrase "consisting essentially of" limits the scope of a claim to the specified materials or steps "and those that do not materially affect the basic and novel characteristic(s)" of the claimed invention. In re Herz, 537 F.2d 549, 551-52, 190 USPQ 461, 463 (CCPA 1976). Burden is upon applicants to clearly show that the

Art Unit: 1755

introduction of additional components would materially change the characteristics of applicant's invention.

Finally with respect to the polishing method limitations of claims 32-34, these limitations would have been obvious because (1) applicants admit that polishing parameters within the claimed ranges are known to be used in polishing methods and (2) Mueller et al. teach that the polishing parameters within the claimed ranges are known to be used in polishing methods.

In all of the above rejections, the limitations of claims 31^u are not seen to provide any patentable weight because the method is the same, irrespective of the function of the RTN film.

Applicant's arguments filed 8/8/05 have been fully considered but they are not persuasive.

Applicants limits the composition and abrasive by "consisting essentially of" and apparently argue that since Yano et al. uses a polymer, the reference composition is outside the claimed "consisting essentially of" limitation. Although the primary reference use polymer particles, the "consisting essentially of" language to define the abrasive does not provide a patentable distinction over this reference because (1) the polymer particle are not necessarily defined as an **abrasives**. In addition, and assuming arguendo, "consisting essentially of" does **not** exclude polymer particles because it is the examiners position that these particles **will not** materially effect the basic and novel characteristics of the composition and thus are still within the limitation of "consisting essentially of". The amount of polymer particles defined by the

Art Unit: 1755

reference can be as low as 0.1 parts (column 9, lines 54-55) and it is the examiners position that this small amount will not result in a change of the basic and novel characteristics of the composition. The transitional phrase "consisting essentially of" limits the scope of a claim to the specified materials or steps "and those that do not materially affect the basic and novel characteristic(s)" of the claimed invention. In re Herz, 537 F.2d 549, 551-52, 190 USPQ 461, 463 (CCPA 1976). **Burden is upon applicants to clearly show that the introduction of additional components would materially change the characteristics of applicant's invention.** To support applicants position, they refer to the comparative examples defined by the reference. The examiner acknowledges these, however, the results defined are for different compositions, when compared to the instant claims, thus any results defined are not commensurate in scope with the claimed invention and the full teachings of the reference. Although a specific example (that uses a specific composition) might show that the polymer particles are critical, this example does not show that the particles are critical in **other compositions** (not exemplified) within the full teachings of the reference. Again burden is upon applicants to show that polymer particles are not within the scope of "consisting essentially of" in compositions according to **the claimed invention**.

Applicants also appear to argue the combination of Yano et al. with Carpio et al. in that since the compositions are completely different, they can not be combined. Applicants have not argued the specific combination applied and/or defined specific clear reasons as to why the combination is improper.

Art Unit: 1755

Applicants also argue the pH limitation of the above reference. The examiner acknowledges applicants remarks, however, claim 2 clearly defines a pH within the claimed range.

In the final office action dated 5/4/05, the examiner withdrew the rejections based on Wang et al. (365) and Dirkson et al., both as the primary references, in view of the insulating layer limitation (see page 8 of the above final rejection). However, after further review, the above references are re applied to reject the claims since the instant claims do not define an insulating layer limitation. Since applicants arguments based on these references were not responded to, the examiner will now respond to the remarks based on these reference (as defined in the response dated 2/10/05)

Applicants apparently argue that Dirkson et al. and Wang et al. fail to teach the use ceric ammonium nitrate (CAN). Although this components is not literally defined it is obvious as defined in the rejections (the obviousness reasons not being argued). Applicants also appear to argue that the reference do not polish RTN films. As defined in the rejections, the disclosure of the reference makes this film obvious which applicants have not addressed. Finally, applicants appear to argue the limitation between the amount of ceric ammonium nitrate (CAN) and the acid. This is not persuasive because this limitation is not in the claims are presented.

Applicants also apparently argue that the references make no correlation between RTN (ruthenium titanium nitride) and CAN. This is not persuasive because, although a correlation is not specifically defined, this is immaterial because the reference compositions can contain CAN (obvious-see above) and can be used to polish RTN films (obvious for the above reasons which applicants has not argued).

Art Unit: 1755

Evidence of unexpected results must be clear and convincing. *In re Lohr* 137 USPQ 548. Evidence of unexpected results must be commensurate in scope with the subject matter claimed. *In re Linder* 173 USPQ 356. To establish unexpected results over a claimed range, applicants should compare a sufficient number of tests both inside and outside (i.e. as well as the upper and lower limits) the claimed range to show the criticality of the claimed range. *In re Hill* 284 F.2d 955, 128 USPQ 197 (CCPA 1960).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael A. Marcheschi whose telephone number is (571) 272-1374. The examiner can normally be reached on M-F (8:00-5:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

10/05
MM

Michael A Marcheschi
Primary Examiner
Art Unit 1755